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## PATENT ABSTRACTS OF JAPAN

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## (54) WASHING AND DEVICE FOR WASHING

## (57)Abstract:

PROBLEM TO BE SOLVED: To provide a washing method capable of sufficiently withdrawing the washing ability of a detergent composition and exhibiting an improved washing power, when a conventional detergent composition for clothes is used to wash the clothes to be washed, and to provide a washing device therefor.

SOLUTION: This method for washing comprises dissolving and/or dispersing a detergent composition in washing water and subsequently bringing the prepared washing liquid into contact with clothes to be washed. The washing device for performing the washing method is provided with (1) a contact mechanism for bringing the washing liquid into contact with the clothes to be washed, and (2) a washing tank for preparing the washing liquid, storing the washing liquid and receiving the clothes to be washed and having a washing means. The washing device for performing the washing method is also provided with (1) a washing tank for storing a washing liquid and receiving the clothes to be washed and having a washing means, and (2) a preliminary dissolution tank for preparing the washing liquid and storing the prepared washing liquid.

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CLAIMS

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[Claim(s)]

[Claim 1] wash -- a wash method characterized by contacting this wash liquid and the washing-ed after making service water dissolve and/or distribute a detergent constituent and preparing wash liquid.

[Claim 2] wash -- a wash method according to claim 1 of making it riping and preparing wash liquid after making service water dissolving and/or distributing a detergent constituent.

[Claim 3] A wash method according to claim 1 or 2 that a degree of hardness of prepared wash liquid is below 1.5-degreeDH.

[Claim 4] claims 1-3 whose pH of prepared wash liquid is 8.0 or more -- either -- a wash method of a publication.

[Claim 5] a claim -- wash equipment which comes to provide laundry sink which holds the washing-ed and has a wash means while being wash equipment for performing a wash method of a publication one to 4 either, preparing a contact device and 2 wash liquid for contacting 1 wash liquid and the washing-ed and collecting this wash liquid.

[Claim 6] a claim -- wash equipment which comes to provide a reserve dissoolver which is wash equipment for performing a wash method of a publication one to 4 either, prepares laundry sink which holds the washing-ed and has a wash means, and 2 wash liquid while collecting 1 wash liquid, and stores this wash liquid

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## DETAILED DESCRIPTION

## [Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention relates to the wash equipment for performing the wash method and it. Furthermore, it is related with the wash equipment for performing the wash method and it which carry out the feature of contacting the wash liquid which is made to dissolve a detergent constituent beforehand and is obtained in detail, and the washing-ed and which can demonstrate enough the detergency which a detergent constituent has.

[0002]

[Description of the Prior Art] The detergent constituent generally used for garments reduces the boundary tension on the front face of fiber, makes the surfactant for promoting solubilization and distribution into the wash liquid of dirt, and fiber swell, and, in addition to this, is constituted from an additive by the sequestering agent for losing the effect by hardness components, such as calcium ion in the alkali chemicals which, in addition, promote the dispersibility to the inside of the wash liquid of dirt, and a waterworks, and magnesium ion, and the list.

[0003] On the other hand, all gestalten, such as a liquid, a \*\*-strike, powder, or massive, are proposed until now, the manufacture method was examined as a gestalt of a detergent constituent, by the presentation and list according to each gestalt, and much applications have been made.

[0004] However, there are few by which the relation of the presentation and gestalt was considered, and when the cost spent on the manufacture method or it except dividing and blending a specific component for improvement in solubility or powder physical properties is taken into consideration, it is usually common [ the detergent component which constitutes the detergent constituent ] to make it exist in same data medium. For example, about a liquid detergent constituent, it is needless to say, and the slurry of the component except the component (for example, perfume, an enzyme, or a bleaching agent) which deteriorates with heating can be easily obtained by processing desiccation, cooling, grinding, a granulation, a making tablet, etc. about powder thru/or a massive detergent constituent.

[0005] Thus, since a sequestering agent and alkali chemicals exist in same data medium, a common detergent constituent is slower [ the reaction of a sequestering agent, and underwater calcium ion or magnesium ion ] than the manifestation of the reaction \*\*\*\* alkali ability of alkali chemicals and water in speed, when water is made to dissolve and/or distribute this detergent constituent. Therefore, the lowering speed of the degree of hardness of wash liquid is slow, and the speed which wash liquid presents alkalinity by one side can consider a very quick thing.

[0006] By the way, the sebum dirt of the body origin contains the fatty acid in the most. The calcium ion in wash liquid and magnesium ion become the cause which can prevent underwater distribution of dirt besides reducing the surface activity ability of a surfactant during washing. This is because soluble low Society for Cutting Up Men is formed by the reaction of the fatty acid in the above-mentioned dirt, and calcium ion and magnesium ion.

[0007] The Society for Cutting Up Men formation speed with a fatty acid, calcium ion, and magnesium ion has noticed especially us that the higher time of the alkalinity (pH) of wash liquid becomes quick. This is considered to be because for the reaction rate of the fatty acid: ionized by alkali chemicals and these ion to be larger than the reaction rate of the fatty acid in dirt, and calcium ion and magnesium ion. Therefore, it is possible that formation of Society for Cutting Up Men on the front face of dirt tends to take place, and the isolation and distribution to the wash liquid of dirt are checked by that cause in the condition that alkalinity-izing of wash liquid is quicker than lowering of the degree of hardness of wash liquid when performing the usual wash. However, in order to obtain sufficient detergency, it is very important conditions that wash liquid presents alkalinity. That is, we have noticed that performance of a detergent constituent cannot necessarily be said to be fully utilizable [ the conventional general wash method ]

[0008] Before adding at laundry sink in the washer by which current marketing is carried out, some which have a dissolver for dissolving a detergent constituent are. However, most objects of these dissolvers are the detergent constituent within laundry sink melting and losing the remainder. Although some goods which make reference about improvement in a detergency also exist, each of such technology has a possibility that wash liquid and the washing-ed may contact in the condition that do not pass although improvement in a detergency is measured by shortening the dissolution time amount of the detergent constituent within laundry sink, and the degree of hardness of the prepared wash liquid does not fully fall, wash which contains calcium ion, magnesium ion, etc. in laundry sink since the degree of hardness of wash liquid is not enough taken into consideration also after most detergent constituents are moreover added in laundry sink -- it may be carried out, with addition of service water not considered. Therefore, the degree of hardness of the wash liquid of laundry sink also has fear that it is still high for a while.

[0009]

[Problem(s) to be Solved by the Invention] In case the object of this invention washes the washing-ed, such as clothing, using the detergent constituent for the conventional garments, it is offering the wash equipment for performing the wash method for demonstrating the detergency which fully pulled out the washing capacity which a detergent constituent's has, and was more excellent, and it.

[0010]

[Means for Solving the Problem] this invention persons -- a result of wholeheartedly examination -- previously -- a detergent constituent -- wash -- after dissolving and/or distributing service water and reducing a degree of hardness of wash liquid beforehand, a detergency came to complete a header and this invention for going up conventionally by making the washing-ed contact.

[0011] namely, a summary of this invention -- [1] wash, after making service water dissolve and/or distribute a detergent constituent and preparing wash liquid a wash method characterized by contacting this wash liquid and the washing-ed, and [2] wash, after making service water dissolve and/or distribute a detergent constituent A wash method of the aforementioned [1] publication of making it riping and preparing wash liquid [3] The above [1] whose degree of hardness of prepared wash liquid is below 1.5-degreeDH, or a wash method given in [2], [4] aforementioned [1]- [3] whose pH of prepared wash liquid is 8.0 or more -- either -- a wash method of a publication -- [5] Aforementioned [1]- [4] It is wash equipment for performing a wash method of a publication either. 1) A contact device and 2 wash liquid for contacting wash liquid and the washing-ed are prepared. Laundry sink which holds the washing-ed and has a wash means while collecting this wash liquid. Wash equipment which it comes to provide [6] Aforementioned [1]- [4] It is wash equipment for performing a wash method of a publication either. 1) While collecting wash liquid, laundry sink which holds the washing-ed and has a wash means, and 2 wash liquid are prepared, and it is related with wash equipment which comes to provide a reserve dissolver which stores this wash liquid. [0012]

#### [Embodiment of the Invention]

1. the wash method of wash method this invention of this invention -- wash -- after making service water dissolve and/or distribute a detergent constituent and preparing wash liquid, it is characterized by contacting this wash liquid and the washing-ed.

[0013] wash used in this invention -- as service water, especially if usually used for wash, it will not be limited. For example, although tap water is common, an underground water and the water of a river may be used depending on an area.

[0014] wash liquid -- wash -- it is prepared by making service water dissolve and/or distribute a detergent constituent. An insoluble component exists in water, such as a zeolite used as a sequestering agent, in the condition of having distributed in wash liquid, a detergent constituent -- wash -- in order to dissolve and/or distribute service water, a certain physical actuation is usually performed. for example, wash -- wash [ make / stir service water and a detergent constituent with an impeller etc., or build a loop-like pipe, and / it / dissolve and/or distribute by circulating the inside of a pipe with a pump etc. ] -- although the mode which mixes service water and a detergent constituent compulsorily can be considered -- only -- vigor -- good -- a detergent constituent -- wash -- the method of adding service water may be used. About a detergent constituent, also as for a case, it is desirable to any to make it dissolve and/or distribute in wash liquid, and the lowering speed of a degree of hardness also fully becomes quick by doing so at.

[0015] since the zeolite which is the principal component of the sequestering agent generally contained in the detergent constituent as a degree-of-hardness lowering agent is insolubility at water -- this component -- wash -- time amount is taken [ after adding to service water ] for the degree of hardness of wash liquid to fully finish falling, therefore -- this invention -- wash -- after making service water dissolve and/or distribute a detergent constituent, it is desirable to make it ripe and to prepare a penetrant remover, as aging actuation -- wash -- after making service water dissolve and/or distribute a detergent constituent, leave this thing, it stirs, or actuation of demonstrating capacity of a sequestering agent, such as raising temperature, and reducing the degree of hardness of wash liquid is mentioned. Although especially the time amount (maturing time) that this aging actuation takes is not limited, its above for 10 seconds is desirable, it is more desirable, and is desirable. [ of especially the above for 1 minute ] [ of the above for 30 seconds ]

[0016] The lower one of the degree of hardness of the wash liquid prepared as mentioned above is desirable. Below 1.5-degreeDH specifically has the desirable degree of hardness of the prepared wash liquid, below 0.8-degreeDH is more desirable, and below 0.5-degreeDH especially is desirable.

[0017] When the sequestering agent blended with the detergent constituent is an ion exchanger as a measuring method of the degree of hardness of wash liquid, wash liquid can be filtered using a hole size 0.2micrometer membrane filter (ADVANTEC Co., Ltd.; product made from a nitrocellulose), and the amount of hardness components contained in a filtrate can be easily measured using the ICP method (ion plasma coupling process) or an EDTA titrimetric method. Moreover, when the sequestering agent blended with the detergent constituent is a chelating agent, a good result can be obtained by adopting a chelate indicator method. Although a chelate indicator method has the need of creating a calibration curve under pH equivalent to subject wash liquid, and ionic strength, it can carry out the quantum of the amount of hardness components of the isolation which could not be caught by sequestering agents, such as a chelating agent, from wash liquid itself, concrete -- for example, -- 4 thWORLD SURFACTANTS CONGRESS the collection of summaries -- the 2nd volume It is indicated by p.159. The method by Chrome Violet (Tokyo -- formation -- more nearly available than Industry) can be used

[0018] The object can be attained by much more detergent constituents coming out so, and combining the above-mentioned method using a membrane filter and an above-mentioned chelate indicator method like, when [ a certain ] the ion exchanger and the chelating agent are used together by the detergent constituent as a sequestering agent. To namely, the filtrate which filtered the ion exchanger in wash liquid using the hole size 0.2micrometer membrane filter, and was promptly obtained in subject wash liquid The quantum of the amount of hardness components of the isolation which is not caught by the chelating agent is carried out by measuring the visible absorption wavelength of coloring liquid after adding ChromeViolet liquid.

[0019] Subsequently, it washes by contacting the prepared wash liquid and the washing-ed, such as clothing. After making the laundry sink which is the field to which contact for wash liquid and the washing-ed is carried out as the wash method at this time fully dissolve and/or distribute a detergent constituent beforehand, the method of adding the wash liquid which prepared the washing-ed by another tub separately besides the method of supplying to laundry sink to the laundry sink containing the washing-ed etc. is mentioned. By reversing a network, after specifically forming the network for putting the washing-ed on the laundry sink upper part as the former, putting the washing-ed on it and wash liquid's being prepared by laundry sink, or dividing etc. The method of throwing the washing-ed into laundry sink etc. is mentioned, as the latter, wash liquid is prepared or the method of supplying wash liquid to the laundry sink into which the washing-ed was thrown from the reserve dissolver using the wash equipment separately equipped with the reserve dissolver for storing suitably etc. is mentioned

[0020] moreover, the wash method of this invention -- setting -- under wash -- a washed object, a detergent constituent, wash liquid, and wash -- service water etc. may be added. It is desirable that the degree of hardness of the washing-ed and the wash liquid after contact is below 2.0-degreeDH, it is more desirable that it is below 1.5-degreeDH, and, specifically, it is desirable that it is especially below 0.8-degreeDH.

[0021] As for the prepared wash liquid which is used for this invention, it is desirable to present alkalinity from a viewpoint of detergency. 8.0 or more have desirable pH of this wash liquid, and, specifically, the range of 9-12 has more desirable pH. Here, pH of wash liquid is measured at 25 degrees C with the usual glass electrode pH meter etc.

[0022] 2. Although it will not be limited as wash equipment of this invention especially if the wash method of this invention can be performed, the mode shown below, for example is shown.

(A) Wash equipment which comes to provide the laundry sink which holds the washing-ed and has a wash means while being wash equipment for performing the wash method of this invention, preparing the contact device and 2 wash liquid for contacting 1 wash liquid and the washing-ed and collecting this wash liquid.

(B) Wash equipment which comes to provide the reserve dissolver which is wash equipment for performing the wash method of this invention, prepares the laundry sink which holds the washing-ed and has a wash means, and 2 wash liquid while collecting 1 wash liquid, and stores this wash liquid.

[0023] The wash equipment of the wash equipment book mode of the mode of (A) prepares wash liquid by the laundry sink which holds the washing-ed and has a wash means while collecting wash liquid. That is, after making the laundry sink which is the field to which contact for wash liquid and the washing-ed is carried out fully dissolve and/or distribute a detergent constituent beforehand, it is applied suitable for the method of throwing the washing-ed into laundry sink. As a type of wash equipment, the so-called wash equipment of a pulsator method is mentioned as a desirable thing.

[0024] Moreover, as a contact device for contacting wash liquid and the washing-ed, after a detergent constituent fully dissolves and/or distributes in laundry sink, a means to throw the washing-ed into laundry sink is illustrated. It is the network for putting the washing-ed formed in the laundry sink upper part, and, more specifically, the network which can throw the washing-ed into laundry sink is mentioned by being reversed or being divided, after a detergent constituent fully dissolved and/or distributes in laundry sink etc. By establishing this contact device, before a detergent constituent fully dissolves and/or distributes, it prevents performing contact for wash liquid and the washing-ed. The charge control means for throwing in the washing-ed in laundry sink in the phase which the wash liquid in laundry sink dissolved and/or distributed to the desired degree may be prepared in this contact device. As this charge control means, a contact means is operated after progress of predetermined maturing time, and the thing equipped with the timer which throws in the washing-ed in laundry sink etc. is mentioned, for example.

[0025] The wash equipment of the wash equipment book mode of the mode of (B) is equipment with which the laundry sink which holds the washing-ed and has a wash means while collecting wash liquid, and the device (reserve dissolver) in which prepare wash liquid and this wash liquid is stored come to exist separately. In this mode, wash liquid is suitably supplied to the laundry sink into which the washing-ed was thrown from the reserve dissolver. Moreover, it is not necessary to supply wash liquid to laundry sink first for example, the washing-ed may be first thrown into laundry sink, and, subsequently wash liquid may be supplied from a reserve dissolver. As a type of wash equipment, the so-called wash equipment of a drum method is mentioned as a desirable thing. Since the wash liquid when washing this in the case of the wash equipment of a drum method is comparatively little, it is from a equipment or a cone about a reserve dissolver.

[0026] Moreover, in this mode, when preparation of wash liquid was performed in a reserve dissolver, the detergent constituent should fully dissolve and/or distribute the wash liquid in contact with the washing-ed. Therefore, it is not necessary to establish the contact device for contacting the wash liquid and the washing-ed like wash equipment of a mode of (A). Moreover, if a detergent constituent fully dissolves and/or distributes [ the wash liquid in the case of contact in the washing-ed and wash liquid in laundry sink ], a detergent constituent does not necessarily need to dissolve and/or distribute the wash liquid in a reserve dissolver fully. Moreover, in the case of the wash equipment of a drum method, since the bath ratio of garments is low, the effect of the wash method of this invention tends to show up notably. Therefore, the wash method of this invention has especially the desirable case where the wash equipment of a drum method is used.

[0027] As a detergent constituent used in this invention, the detergent constituent for garments usually known can be used. Specifically, what consists of a surfactant, a sequestering agent, alkali chemicals, and other washing components is mentioned.

[0028] As the above-mentioned component, specifically Alkylbenzene sulfonates, Surfactants, such as an alkyl-sulfuric-acid ester salt and polyoxyethylene alkyl ether: The crystalline aluminosilicate which is a zeolite, And JP.7-89712.A, JP.60-227895.A Crystalline silicate given in an official report, Sequestering agents, such as ethylenediaminetetraacetic acid (EDTA) and citrate: Polyacrylic acid, The copolymer of an acrylic acid and a maleic acid And carboxylic-acid system polymer, such as a carboxymethyl cellulose: Extending agent, polyethylene glycols ], such as an alkali-chemicals: sodium sulfate ], such as alkali-metal silicate, such as alkali-metal carbonates, such as soda ash, and JIS 1 and 2, or a No. 3 specific silicate, (PEG), It reaches a polyvinyl pyrrolidone (PVP), Bleaching agent: tetraacetylenethylenediamin (TAED), such as dispersants, such as polyvinyl alcohol (PVA), or a color change inhibitor: fault sodium carbonate, A bleaching activator given in JP.6-316700.A; A protease, Defoaming agent: antioxidants, such as fluorescent dye: silicone, silica system of enzyme stabilizer; biphenyl molds, such as enzyme: boron compounds, such as a cellulase, an amylase, and lipase, and a sodium sulfite, and a stilbene mold: a well-known component can be mentioned to a blueing agent list from the former, such as perfume. It can refer to what is indicated by details at JP.8-218093.A more.

[0029] in addition, wash of a sequestering agent -- the addition to service water -- wash -- it is desirable that it is especially sufficient amount to make the degree of hardness of service water below into 0.5-degreeDH, wash -- wash which uses the amount of a sequestering agent required to make the degree of hardness of service water into a desired value -- it can ask from the calcium ion prehension ability (CEC) of the degree of hardness of service water, and the sequestering agent to be used etc. in addition, wash to be used -- the distance hardness of service water is measured by the ion coupling plasma method (the ICP method)

[0030] The measuring methods of the ion prehension ability of a sequestering agent differ by whether the sequestering agent to be used is an ion exchanger or it is a chelating agent. It is as follows when the measuring method is described about each matter:

[0031] After weighing 0.1g of ion exchangers precisely in the case of an ion exchanger and stirring [ be / it / under / calcium chloride aqueous solution (concentration is 500 ppm as  $\text{CaCO}_3$ ) 100mL / adding ] between 60 parts at 25 degrees C, it filters using a hole size 0.2micrometer membrane filter (ADVANTEC Co., Ltd., nitrocellulose make), and the amount of the calcium ion contained in the filtrate 10mL is measured by EDTA titration. From the value, the calcium ion exchange capacity (cation exchange capacity) of the ion exchanger of the object of measurement is calculated. For example, in this invention, mineral matter, such as a crystalline alkali-metal silicate and an aluminosilicate (others [ zeolite ]), is measured as an ion exchanger.

[0032] In the case of a chelating agent, calcium ion prehension ability is measured as follows using a calcium ion electrode. In addition, a solution is altogether prepared using the following buffer solution:

Buffer solution: 0.1 M- $\text{NH}_4\text{Cl}$ - $\text{NH}_4\text{OH}$  buffer (pH10.0)

(i) The creation standard calcium ion solution of a calibration curve is created, and the calibration curve which shows the logarithm of calcium ion concentration and the relation of potential like drawing 1 is created

[0033] (ii) Weighing capacity of the chelating agent of about 0.1g of measurement of the prehension ability of calcium ion is carried out, it puts into a 100mL measuring flask, and a scalpel rise is carried out with the above-mentioned buffer solution. Thus,  $\text{CaCl}_2$  by which

calcium ion concentration is equivalent to the prepared chelating agent content buffer solution at 20000 ppm (CaCO<sub>3</sub> conversion) An aqueous solution (pH10.0) is dropped from a buret. Dropping is CaCl<sub>2</sub>. It carries out by adding 0.1-0.2 mLs of aqueous solutions at a time, and the potential at that time is read. Moreover, it is CaCl<sub>2</sub> also like the buffer solution which does not contain a chelating agent. Aqueous solution dropping is performed. This solution is called a blank solution. It asks for calcium ion concentration from the calibration curve of drawing 1, and is CaCl<sub>2</sub>. The drip of an aqueous solution and the relation of calcium ion concentration are shown in a graph (drawing 2). Among drawing 2, Line P shows the data of a blank solution (when the buffer solution which does not use a chelating agent is used), and Line Q shows the data at the time of using the chelating agent content buffer solution. The extension wire of Line Q and an intersection with a horizontal axis are set to A, and it asks for the calcium ion prehension ability of a chelating agent from the calcium ion concentration of the blank solution in A. For example, in this invention, carboxylate polymers, such as an acrylic-acid-maleic-acid copolymer, are measured as a chelating agent in polycarboxylic acid salt lists, such as citrate

[0034]

[Example] Hereafter, although an example etc. explains this invention in more detail, this invention is not limited at all by these examples etc.

[0035] The detergent constituent of the example 1 of combination of a table 1 was manufactured by the one or less example [ of manufacture ] method. The aqueous slurry of 50 % of the weight of water content by which each component of a publication was blended with a table 1 was prepared. However, the zeolite blended the amount used 18/23 time the amount of the with the slurry, and an enzyme, perfume, and crystalline silicate were not blended with a slurry. Spray drying of the obtained slurry was carried out, the spray drying particle was obtained, subsequently this particle was corned with the screw knockout granulating machine, and the detergent constituent was obtained. The detergent constituent was put into the rotary kiln, an enzyme, crystal silicate, and the remaining zeolite were blended, the spray of the perfume was carried out simultaneously, and the last detergent constituent was obtained.

[0036] The detergent constituent of the example 2 of combination of a table 1 was manufactured by the two or less example [ of manufacture ] method. Components other than AE, oil absorption support, soda ash, an enzyme, perfume, and crystalline silicate were blended, and the aqueous slurry of 50 % of the weight of water content was prepared. Spray drying of the obtained slurry was carried out, and the spray drying particle was obtained. The obtained spray drying particle, soda ash, oil absorption support, and crystalline silicate were fed into the REDIGE mixer (stirring tumbling granulator, made in Matsusaka Research Institute), and stirring was started. In addition, the loadings of oil absorption support here were 8/13 time the amount of the amount used. The spray of AE was carried out there and the granulation was performed. Subsequently, oil absorption support 3.5/13 time the amount of the amount used was supplied, and surface treatment was performed. The obtained granulation particle was put into the rotary kiln, the remaining oil absorption support and an enzyme were blended, the spray of the perfume was carried out simultaneously, and the last detergent constituent was obtained.

[0037] It measured by the method which showed the powder physical properties of the obtained last detergent constituent below. The result is collectively shown in a table 1.

(A) Bulk density was measured according to the method of JIS:K -3365.

(B) The fluidity was measured according to ASTM:B 213-48.

(C) Mean particle diameter was measured according to the method of JIS:K -3362.

[0038]

[A table 1]

		配合例 1	配合例 2
配合組成 (重量%)	LAS	16.5	—
	α-SFE	8.0	—
	AE	2.9	17.0
	石鹼	6.0	5.0
	ゼオライト	23.0	15.0
	吸油担体	—	13.0
	ソーダ灰	24.0	9.0
	非晶質ケイ酸塩	1.0	1.0
	結晶性シリケート	5.0	20.0
	亜硫酸ソーダ	1.0	1.5
	芒硝	バランス	バランス
	アクリル酸-マレイン酸	2.0	5.0
	共重合体		
	蛍光染料	0.2	0.3
	酵素	1.2	1.2
	香料	0.2	0.15
	水分 (揮発分)	2.8	2.5
嵩密度 (g/cm <sup>3</sup> )		799	847
流動性 (秒)		6.28	6.15
平均粒径 (μm)		535	415

[0039] Below, each component in a table 1 is explained in full detail. The thing of carbon numbers 12-13 was used for LAS by straight chain alkyl benzene sodium sulfonate. Alpha-SFE is alpha olefin sulfonic-acid sodium, and the thing of carbon numbers 16-18 was used for it. AS for AE, carbon numbers 12-16 and the number of average ethyleneoxide addition moles used the thing of 7.0 with polyoxyethylene alkyl ether. Beet tallow fatty-acid sodium was used for soap. FourA mold zeolite and the mean particle diameter of 3 micrometers (TOSOH



CORP. make) were used for the zeolite. calcium ion prehension ability (CEC) was 280CaCO(s)3 mg/g.

[0040] Oil absorption support used the amorphous aluminosilicate obtained by the example 1 of the following composition.

Sodium carbonate was dissolved in synthetic example 1 ion exchange water, and the aqueous solution of concentration was prepared 6% of the weight. 132g of this aqueous solution and 38.28g (50 % of the weight of concentration) of sodium aluminate aqueous solutions were put into the reaction vessel with a baffle of capacity 1000mL, and these were mixed. It was made to react to the obtained mixed solution under strong stirring, being dropped at 40 degrees C No. 3 water glass pouring | which was diluted with twice as many water as this / 201.4g ] it for 20 minutes. Under the present circumstances, CO2 By blowing gas, pH of the system of reaction was controlled to about 10.5, and the reaction rate was optimized. Then, the system of reaction was heated to 50 degrees C, and it stirred for 30 minutes at this temperature.

[0041] Then, it is CO2 to the system of reaction. Gas was blown and superfluous alkali was neutralized (pH=9.0). The obtained neutralization slurry was filtered under reduced pressure using the filter paper (No| by Toyo Roshi Kaisha, Ltd. J.5C). 1000 times as many water as this washed the filtration cake, subsequently filtration desiccation (105 degrees C, 300torr, 10 hours) was carried out, cracking was performed further, and amorphous aluminosilicate fine particles (mean particle diameter of 10 micrometers) were obtained. In addition, 298.7g of NaOH aqueous solutions was put into 4 opening flask of 1000mL 48% of the weight with aluminum(OH)3 243g, it mixed, and the sodium aluminate aqueous solution was prepared by heating for 30 minutes and making it dissolve at 110 degrees C under stirring.

[0042] The presentations of the obtained amorphous aluminosilicate were 2 = 52.4 % of the weight of SiO(s), and Na2 O=18.0 % of the weight aluminum2 O3 =29.6% of the weight as a result of atomic absorption analysis and plasma emission spectrometry (1.0Na2 O-aluminum2 O3 and 3.10SiO2). Moreover, the ratio of the pore volume in which the ratio of the pore volume in which 185CaCO(s)3 mg/g and oil absorption ability have pore size (285mL(s) / 100g, and less than 0.1 micrometers) in CEC has 0.1-2.0-micrometer pore size 9.4% was 76.3%, and the content moisture content was 11.2 % of the weight.

[0043] The amorphous silicate used the No. 1 sodium silicate (TOSOH CORP. make). Crystalline silicate ground powder SKS-6 (the Hoechst Tokuyama make) with the hammer mill, and used what was made into the mean particle diameter of 50 micrometers. In addition, CEC was 224CaCO(s)3 mg/g. An acrylic-acid-maleic-acid copolymer is blended as sodium salt (70 mol % neutralization object), and monomer ratios are an acrylic acid / maleic-acid =3 / 7 (mole ratio). In addition, CEC was 380CaCO(s)3 mg/g. Fluorescent dye blends the HOWAI tex SA (Sumitomo Chemical Co., Ltd. make) with Tinopal CBS-X (Ciba-Geigy make) by the weight ratio of 1:1. An enzyme blends Cellulase K (thing given in JP,63-264699,A), API-21H (Showa Denko K.K. make), and RIPORAZE 100T (product made from Novo) by the weight ratio of 7:4:1, in addition, wash -- the degree of hardness of service water and wash liquid was measured by the method of a publication to the above.

[0044] To the example 1 pulsator mold automatic washing machine (NA-F70VP1 mold, Matsushita Electric Industrial Co., Ltd. make), water was first stored in 49l, tap water (3 degreeDH, 20 degrees C) at laundry sink, 32.7g of detergent constituents obtained by the example 1 of manufacture was thrown in, it stirred in standard stream mode for 1 minute, and the wash liquid which dissolves and/or distributed the detergent constituent was prepared (at this time, 0.8 degrees of degrees of hardness of wash liquid were DH and pH10.6.). 2 sets of contamination cloths which fixed five artificial solid fabrics (5cmx5cm angle) shown in the example 1 of preparation here at \*\*\*\* of cotton calico 2003 cloth (30cmx45cm angle), and polyester / 1.09kg [ of non-worn cotton Meliae underwears ] (Gunze, Ltd. make), and cotton =50/- 0.54kg (product made from CHOYA) of grounds was put into laundry sink 50 \*\*\*\*, it adjusted to the bath ratio 30 | about ], and wash was performed for 6 minutes. Then, after rinsing twice by storing using the above-mentioned tap water, indirect desulfurization water was carried out for 6 minutes. The rate of washing was computed by having measured the reflection factor of the artificial solid fabric after wash. The rate of washing of the artificial solid fabric in this example was 65.3%.

[0045] The same washing-ed as what was first used for the same washer as example of comparison 1 example 1 in the example 1 was thrown in, namely, 2 sets of contamination cloths, 1.09kg of non-worn cotton Meliae underwears, and mix spinning -- 0.54kg of ground was supplied to laundry sink. Subsequently, water was poured into laundry sink in 49l, tap water (3 degreeDH, 20 degrees C), and 32.7g of detergent constituents obtained in the example 1 of manufacture was thrown in (bath ratio 30 | about ]). Subsequently, wash actuation of the same two 6-minute wash-rinse-dehydration as an example 1 was carried out. The rate of washing of the artificial solid fabric after wash was 56.1%.

[0046] an example 1 and the example 1 of a comparison -- beforehand -- wash -- after preparing the wash liquid which made service water dissolve and/or distribute a detergent constituent, it turned out that the direction of the wash method of contacting this wash liquid and the washing-ed has a high rate of washing.

[0047] In the 2 dram type washer (ES-E61 mold, Sharp Corp. make) of examples, water was first stored in 20l, tap water (3 degreeDH, 20 degrees C) at the laundry sink, and 15g of detergent constituents obtained by laundry sink in the example 2 of manufacture was thrown in. After specifically pouring in the detergent constituent which 0.5l, tap water (3 degreeDH, 20 degrees C) was made to distribute from a dispenser (detergent input port) to laundry sink, laundry sink was supplied 0.5l, tap water washing a reserve dissolver. Subsequently, it stirred in standard stream mode for 1 minute, and the wash liquid which dissolves and/or distributed the detergent constituent was prepared (0.7 degrees of degrees of hardness of wash liquid were DH and pH10.9.)

[0048] The same washing-ed as what was used here in the example 1 was thrown in, namely, 2 sets of contamination cloths, 2.0kg of non-worn cotton Meliae underwears, and mix spinning -- 1.0kg of grounds was supplied to laundry sink (the bath ratio was about 7.). Subsequently, the rinse process which consists of a dehydration process for | it stores for 5 minutes with 21l, tap water (3 degreeDH, 20 degrees C) and follows a rinse process and it ] 10 minutes was performed 3 times the wash for 20 minutes, and after dehydration for 10 minutes. The rate of washing of the artificial solid fabric after wash was 65.3%.

[0049] The same washing-ed as what was first used for the same washer as example of comparison 2 example 2 in the example 2 was thrown in. Subsequently, water was poured into laundry sink in 21l, tap water (3 degreeDH, 20 degrees C), and the detergent constituent, obtained in the example 2 of manufacture was thrown in by the method as an example 2 that 15g is the same (bath ratio 7 | about ]). The same wash process as an example 2, the dehydration process, and the rinse process were performed, and the washing-ed was washed. The rate of washing of the artificial solid fabric after wash was 57.1%.

[0050] an example 2 and the example 2 of a comparison -- beforehand -- wash -- after preparing the wash liquid which made service water dissolve and/or distribute a detergent constituent, it turned out that the direction of the wash method of contacting this wash liquid and the washing-ed has a high rate of washing.

[0051] Except having set mixing time for preparation of example 3 wash liquid (maturing time) for 10 seconds and as for 30 seconds, the same actuation as an example 1 was performed, and the washing-ed was washed. When maturing time was for 10 seconds, 1.3 degrees of

degrees of hardness of the prepared wash liquid were DH and pH10.7, and the rate of washing of the artificial solid fabric after wash was 60.1%. Moreover, when maturing time was for 30 seconds, 1.0 degrees of degrees of hardness of the prepared wash liquid were DH and pH10.8, and the rate of washing of the artificial solid fabric after wash was 63.6%. In any case, it was higher than 56.1% which is the rate of washing of an artificial solid fabric at the time of washing in the mode which is not making water dissolve and/or distribute a detergent constituent beforehand (example 1 of a comparison).

[0052] It washed by the almost same actuation as example 4 example 2. Mixing time for preparation of the amount of water which stored water in advance of 10.5l, and wash liquid (maturing time) was set as for 1 minute. Then, the washing-ed was put into laundry sink, and it washed, after pouring water in 10.5l, tap water the speed for 3l/. The rate of washing of the artificial solid fabric after wash was 61.3%. this case -- beforehand -- wash -- it was the rate of washing higher than 57.1% which is a rate of washing at the time of washing in the mode which is not making service water dissolve and/or distribute a detergent constituent (example 2 of a comparison).

[0053] In addition, the aforementioned rate of washing adhered the artificial-pollution liquid of the example of preparation 1 following presentation computed by the following method to cloth using the following artificial solid fabric, and prepared the artificial solid fabric. Adhesion on the cloth of artificial-pollution liquid used the gravure type contamination machine using the gravure roll coater shown in Japanese Patent Application No. No. 63273 [ six to ]. The process which is made to carry out gravure of the artificial-pollution liquid to cloth, and produces an artificial solid fabric was performed in cel capacity of 58cm<sup>3</sup> / cm<sup>2</sup>, spreading speed 1.0 m/min, drying-temperature [ of 100 degrees C ], and drying-time 1 minute. [ of a gravure roll ] Cloth used cotton calico 2003 cloth (made in the Yagashira firm).

[0054] [A presentation of artificial-pollution liquid]

A lauric acid A 0.44-% of the weight myristic acid A 3.09-% of the weight pentadecane acid A 2.31-% of the weight palmitic acid A 6.18-% of the weight heptadecanoic acid 0.44-% of the weight stearin acid 1.57-% of the weight oleic acid A 7.75-% of the weight triolein 13.06-% of the weight palmitic-acid n-hexadecyl 2.18-% of the weight squalene 6.53-% of the weight albumen lecithin liquid crystal object 1.94-% of the weight Kanuma red clay 8.11-% of the weight carbon black 0.01-% of the weight tap water Balance [0055] (Calculation of the rate of washing) The original cloth and the reflection factor in 550nmicro before and behind washing were measured with the account colorimeter of \*\* (Shimadzu make), and the rate D of washing (%) was computed by the degree type.

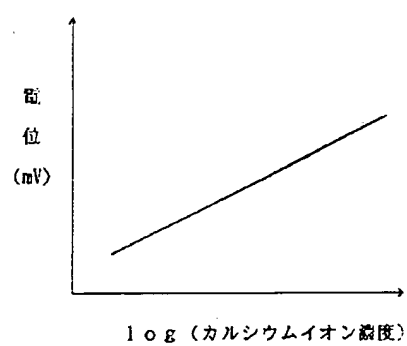
$D = (L2 - L1) / (L0 - L1) \times 100 (\%)$

L0 : Reflection factor L1 of a original cloth : Reflection factor L2 of the contamination cloth before washing : Reflection factor of the contamination cloth after washing [0056]

[Effect of the Invention] By the wash method of this invention, the washing capacity which a detergent constituent has can fully be pulled out, and, thereby, the more excellent detergency can be demonstrated. Moreover, the wash equipment of this invention is suitable wash equipment to apply the wash method of this this invention.

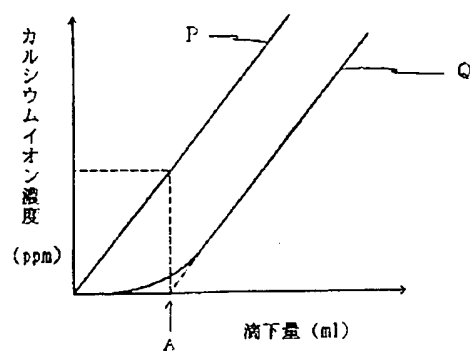
[Translation done.]

Drawing selection drawing 1



[Translation done.]

## Drawing selection drawing 2



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